# Pythagoras by Ed Downey

**[Background](http://web.ebscohost.com/srck5/detail?sid=8b432b0c-e8d7-4f06-a1ae-0af83d7f8e58%40sessionmgr110&vid=5&hid=122&bdata=JnNpdGU9c3JjazUtbGl2ZQ%3d%3d" \l "toc)**

Pythagoras was an ancient Greek philosopher famed for his mathematical knowledge and mystical philosophy. He was born around 570 BCE and died around 490 BCE. These dates place him more than a century before Socrates and Plato.

Pythagoras was born on the island of Samos, where he spent his early life. Samos lies just off the coast of what is now Turkey. Interestingly, this island was near Miletus, a major Ionian colony. Ionia was home to many of the earliest Greek philosophers, and is famous for being the birthplace of Greek philosophy.

When he was around forty years old, Pythagoras left Samos to escape the increasingly tyrannical rule of its dictator. He traveled to the western part of the Greek world, southern Italy. There, in the town of Croton, he established a community that was part school and part religious group. Over the centuries, many of these Pythagorean communities would be established throughout the ancient world.

The Pythagorean communities followed a strict religious lifestyle, and carried out investigations into math and science. Little is now known of the schools' specific lifestyle and religious teachings. This is due in part to the vow of secrecy taken by members. It is certain that the members considered themselves to be an elite group, perhaps even a ruling class, by virtue of their knowledge and talent.

Members of Pythagorean societies often became involved in the political life of the cities in which they lived. This generated resentment among non-members, and conflicts (sometimes violent) occurred. After one such conflict in Croton, Pythagoras fled the city to nearby Metapontium, also in southern Italy. He set up another community before dying there.

Pythagoras was famous during his lifetime. He was reputed to have traveled widely, and may in fact have made a trip to Egypt. After his death, many myths and legends were attached to him. He was rumored to have had a thigh made of gold. He was said to have been seen in two different cities at the same day and time, and was believed to have been spoken to by a river he was crossing in a boat. All of this makes it difficult to determine the facts of his life.

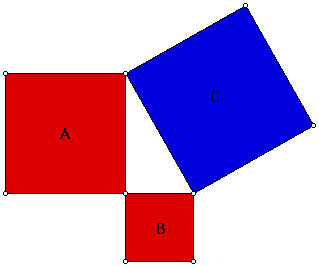
Pythagoras is also difficult to study because he wrote nothing that has survived. In fact, there is no evidence he wrote anything that didn't survive. It is possible that, in line with the code of secrecy he instituted among his followers, all of his teachings were communicated orally.

Moreover, no detailed account of Pythagoras comes to us from his contemporaries. All the accounts we have are from later writers. A few centuries after his death, a number of ***forgeries*** were written in his name, making matters even worse.

The confusion surrounding his life is made worse by the fact that Pythagoras set up communities of followers that continued to work long after his death. Many of the teachings of these followers have been misattributed to Pythagoras himself. So when we speak of Pythagoras, it must be kept in mind that we are speaking of the larger philosophical tradition he founded, and not necessarily the man himself.

[**Mathematical Philosophy**](http://web.ebscohost.com/srck5/detail?sid=8b432b0c-e8d7-4f06-a1ae-0af83d7f8e58%40sessionmgr110&vid=5&hid=122&bdata=JnNpdGU9c3JjazUtbGl2ZQ%3d%3d#toc)

The most famous accomplishment attributed to Pythagoras is the one that was named after him: the Pythagorean theorem. Traditionally, Pythagoras is credited with having discovered, and then proved, that the sum of the squares of the lengths of the two shorter sides of a right triangle is equal to the square of the length of the longer side (hypotenuse) of the triangle.

In its most common form, the theorem says: *a² + b² = c²*, where *a* and *b* are the lengths of the legs of the triangle (the sides that form the right angle) and c is the length of the hypotenuse (the side opposite the right angle).

The best historical research indicates that this is too much credit to give to one man. Pythagoras probably did not provide a formal proof of the theorem. Aside from a proof, the theorem's simple mathematical truth was known before Pythagoras' time in other cultures. So in all likelihood, while Pythagoras or later Pythagoreans may have known of this theorem, they did not discover it. It is more likely a case of it being attributed to him by later generations.

Scholars are on firmer ground with the next philosophical claim that Pythagoras made. It is quite likely that he did in fact teach, as history records, that the world is basically mathematical.

Pythagoras is said to have claimed that everything is numbers. What he meant by that is a little more complicated than it seems. Pythagoras was referring to ratios and numerical relationships. Numbers were understood geometrically, as points arranged in patterns. The number four, for example, was expressed as two rows of two points each, forming a square. Three was expressed as a triangle of three points, one in the top row and two underneath.

Pythagoras believed that such relationships underlay everything in the world. Indeed, the research Pythagoreans carried out in astronomy, music, and other fields were mathematical in nature. Astronomy could be understood mathematically by focusing on measurements and their ratios to determine the size, speed, and distance of the heavenly bodies.

In music, Pythagoras and his followers made one of their more famous discoveries: that the notes produced by certain instruments are related to one another mathematically. Certain important notes produced by plucking a string, for example, are influenced by the length of the string. Perfect consonances on the musical scale (intervals called the fourth, the fifth, and the octave) can be expressed as ratios. An octave, for example, is a ratio of 2 to 1, in terms of string length.

These mathematical patterns were taken to be the foundation of music. What was true of music was projected to be true of everything else in the world, that ultimately, everything could be reduced to numbers and ratios.

Pythagoras and his followers saw a mathematical "harmony" behind all these natural phenomena. This harmony was paralleled in the body and in the soul. They considered medicine to be the art of restoring harmony in the body between different tendencies and extremes. In dealing with the soul, they taught skills and values designed to promote temperance and self-control, in order to create and preserve a balance between different passions.

Pythagoreans also saw numbers behind social phenomena, although these ideas are less clear to us. Justice, for example, was related to the number four, which was the square number. In some way they saw two rows of two dots, forming a square, as an embodiment of balance and harmony.

While the Pythagoreans may have gone more than a little beyond the available evidence in their thought, they did make a key insight. Today's physicists still describe the physical world with numbers and equations.

Downey, E. (2006) Pythagoras. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=mih&AN=22302370&site=srck5-live

(2011) Created by The Meadows Center for Preventing Educational Risk for use in Institute of Education Sciences, grant #26-1802-23, 2010-2014).

Lexile 990/ Word count 1139